World Applied Sciences Journal 2013 vol.23 N1, pages 51-55

Development of the technology of black oil macromolecular structuring in the process of its oxidation for obtaining the bituminous insulating materials

Kemalov A., Kemalov R.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

One of the effective ways to improve the properties of special bitumens are their chemical and physical modification. When considering a chemical approach, we assumed that a process of oxidative polymerization is connected with radical-chain reactions. That is why when carrying out an oxidizing process of residual oil stock, it is necessary to use the modifiers, which are able to take part in this process, subjecting the segments of paraffin chains to chemical structuring with further formation of polycyclic naphthene-aromatic fragments, promoting the intense resin formation and preventing from the formation of the asphaltene crystalline phase. The analysis of physical-mechanical properties of bituminous insulating materials (BIM), based on acidified flux oil, showed the ambiguity of their assessment, i.e. at identical speeds of fuel-oil residues oxidation processes, there are differences in strength properties of coverings (C). The properties of air-blown asphaltic bitumen are regulated by resizing of the core and solvation shell of the complex structural unit (CSU) by injection of multicomponent bifunctional modifier (MBM), promoting the reduction of oxidation duration and the improvement of physical-mechanical and insulation properties of BIM.

http://dx.doi.org/10.5829/idosi.wasj.2013.23.01.13035

Keywords

Complex structural units, Infrared spectroscopy, NMR-relaxometry, Oxidative polymerization, Paraffin-asphaltene associates, Physical-chemical modification, Residual oil stock